Statement of
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before the
Subcommittee on Science, Technology, and Space
Committee on Commerce, Science, and Transportation
United States Senate

March 5, 1998

Thank you, Mr. Chairman and Members of the Subcommittee. I appreciate this opportunity to discuss with you NASA's views on the commercialization of space. Before I get to my specific discussion of support to commercial space, I would like to make a few introductory observations. For the last 10 years, as NASA's General Counsel, and before that as Deputy General Counsel, I have been involved in the Agency's many efforts to foster commercial space activity. Based on that experience, I know that governmental actions can and do affect the commercial space industry, but the effects are neither simple nor uniform across the industry. Today's commercial space industry is very diverse and what helps one part may well harm another. I do not think it is a stretch to conclude that a policy that helps a large established commercial space transportation service provider may not be best for a small new entrant into the space transportation business. Further, what helps the space transportation sector can also hurt the satellite builder and the space service user community. Yet it is the existence of all these portions of the U.S. commercial space industry that illustrates the health and vitality of the industry. It is the balance among and the sum of the activity of all parts of the industry that led sales volume in support of commercial space activity to exceed that for Governmental space activity last year.

While this diversity is one of the clearest signs of the health and vitality of this rapidly evolving industry, it presents significant challenges for legislators and policymakers.

Indeed, the rapid pace of industry evolution has often exceeded the ability of the policy apparatus to respond in a thoughtful manner, leading me to conclude that, as in medicine, the key phrase for every space policymaker should be "first, do no harm." It is an often cited truism that a developing industry needs a stable regulatory environment. Each time a statute is passed or a policy implemented, complex judgments are being made that will alter the interrelationships among the launch industry and the satellite makers, the new industry entrants and the established companies, and the buyer and the seller. But we have seen that the various elements of the commercial space industry can adapt to those changes. What they cannot do is start down one path in reliance on a given policy or rule and have it changed after they have made their initial strategic decisions and investments. Thus, we as policymakers must take care to understand the implications of our actions for the whole spectrum of commercial space activity. If we are to err, let it be on the side of leaving the policy framework stable for too long, not by creating a constantly changing landscape for the industry to traverse.

Today, we are here to testify concerning the importance of Commercial Space. I believe that much of the House passed version of H.R.1702 is responsive to the needs of the commercial space industry. However, the Administration proposed several amendments in the Statement of Administration Policy on H.R. 1702 last November when the bill was being considered on the floor. I want to express NASA's strong and continuing support for the Administration-backed amendments that were not adopted by the House. I will also address one issue that has arisen concerning H.R. 1702 since last November and discuss two commercial space related provisions from NASA's proposed FY 1998 authorization bill.

Amendment to the Launch Services Purchase Act Foreign Policy Exemption

Since last November, a new issue has arisen related to H.R. 1702 which, from NASA's perspective, would amend the Launch Services Purchase Act in a particularly detrimental and cumbersome manner. Specifically, the House passed version provides that whenever the Federal Government seeks to launch one of its payloads on a foreign launch vehicle,

the Administrator, in consultation with the Secretaries of State and Transportation, would have to obtain a separate legislative enactment permitting NASA such authority, unless the proposed activity fit within another of 6 stated exceptions.

To begin with, this language is in conflict with the National Space Transportation Policy (NSTC-4, August 5, 1994), which states that the policy of launching on U.S.-manufactured vehicles "does not apply to use of foreign launch vehicles on a no-exchange-of-funds basis to support the following: flight of scientific instruments on foreign spacecraft, international scientific programs, or other government-to-government programs. Such use will be subject to interagency coordination procedures." While new statutes can clearly override inconsistent policy formulations, the current space transportation policy is quite useful in supporting our active program of international cooperation.

NASA frequently enters into agreements with international partners to maximize its ability to return valuable science and research data. Since science data is shared with the world community of scientists, it makes good sense that the cost of acquiring that science should be shared by international partners, rather than be borne solely by the U.S. Yet if in every cooperation NASA is required to supply the launch vehicle, the international partner would, by necessity, have to supply the science payload. This might give U.S. launch service providers an extra launch or two, but it would be at a dreadful cost to U.S. payload providers and U.S. scientists. Under such a statutory scheme, foreign scientists would be in a favored position over U.S. scientists, always performing the science portion of a cooperative program, giving foreign scientists the sole opportunity to propose and create instruments and spacecraft for cooperative programs. The current system, supported by current policy, allows agreements where either party may provide either the launch opportunity or the payload. This results in more balanced opportunities for science missions and broader dissemination of scientific results. Examples of missions where NASA launched on a foreign launch vehicle, but which would be practically precluded by the proposed amendment, include ADEOS and TRMM with Japan, CLUSTER with ESA

(on Ariane) and TOPEX/Poseidon with the French Space Agency, CNES.

In addition to cooperative science programs, NASA has plans for some launches of U.S. Government payloads on foreign vehicles in the future. In the International Space Station program, where dollars are tight for all partners, the Intergovernmental Agreement (IGA) provides that the parties will cooperate in a manner to minimize the transfer of funds. To do that, the United States must be able to accept in-kind services such as transportation. This was the case under the 1988 Space Station agreements and was confirmed in our negotiations on the revised agreements which were signed on January 29, 1998. This arrangement serves several purposes: it allows our partners to meet their financial obligations through provision of services, thus sharing the burden of operations costs, and it allows the program the flexibility to place payloads on the vehicle which makes the most sense as part of our mixed fleet concept for the International Space Station.

NASA's Earth Science, Space Science and Human Exploration and Development of Space Enterprises are enhanced and enabled by international cooperation. As we pursue "faster, better, cheaper" missions and other innovative approaches to our programs, our ability to enter into international agreements needs to remain flexible and responsive. In short, requiring specific legislation each time it is proposed to launch a cooperative mission on a foreign vehicle is unworkable in the context of NASA's mission to engage in programs of international cooperation and in the peaceful application of the results. Not only would NASA's program be hurt, so would U.S. scientists and U.S. payload providers.

Cross-waivers and Indemnification

Outside the scope of H.R. 1702, there are two issues which we have been discussing with your staff and which we feel are of great importance to NASA's support of commercial space activity. These issues, which are addressed by language contained in NASA's FY 1998 authorization bill submitted by the Administration last year, concern two fundamental, related, yet distinct liability issues, namely: cross-waivers of liability and indemnification. Cross-waivers of liability relate to, primarily, first-party and second-party liability, while indemnification relates to third-party liability.

In cross-waivers of liability, each party agrees to bear its own risk of participation in a joint space activity, and is thus freed from the concern that it may be liable for other parties' contributions. Specifically, each party participating in – and benefiting from – the covered activity agrees that it will not bring claims against the other participating parties. Without a cross-waiver, each participant could be subject to the total risk of the activity, not just its own participation. As such, scarce funds would be spent on duplicative and expensive insurance, not on productive activity. Not all liabilities are waived, however, just those of the parties and their contractors and subcontractors. Claims by natural persons, such as employees, as well as claims premised upon willful or intentional harms, are explicitly *not* prevented by the cross-waivers of liability. To do otherwise; to waive, for instance, the claims of an astronaut or his or her estate would not only be unfair; it could even be unconstitutional. In other words, an injured person, or his or her estate, does not forfeit any rights by reason of a cross-waiver.

Cross-waivers of liability are inherently appropriate for many of NASA's aerospace activities because our mission lies at the cutting edge of aeronautical and space development and exploration, and involves unique, highly valuable equipment and property. Further, the waivers are a mutual undertaking of the parties, who, if they can afford to be involved in space activity, are knowledgeable and sophisticated entities

capable of protecting their own interests.

Cross-waivers of liability were first implemented during the 1970s, and since that time have become the standard in the space launch world, both for commercial and government-sponsored activities. NASA has employed them, to great effect, throughout its long history of Launch Services Agreements and in its many international and domestic cooperative activities. Such waivers are now an indispensable element of high-risk space and aeronautical activities worldwide, as other space-faring nations have come to appreciate the great value and practicality of these instruments. Nearly a decade ago, the Congress specifically reassessed NASA's cross-waiver practice in its consideration of amendments to the Commercial Space Launch Act (CSLA) and, as a result, required such cross-waivers as a condition of commercial space launch agreements licensed by the Department of Transportation. In doing so, the Congress expressly noted that "[t]hese waivers are a standard element in all [NASA] launch contracts." S. Rep. No. 100-593, 100th Cong., 2d Sess. 14 (1988). They remain so today, and are used in all of NASA's Launch Services Agreements and cooperative aerospace programs.

Beyond merely saving money, the cross-waiver also encourages space activity by reducing uncertainty. With the largest class of potential claims eliminated, each party may proceed unburdened by the concern that other involved parties may bring claims against it. This is particularly important in the commercial context: while governments may more easily elect to self-insure against catastrophic losses in a given high-risk activity, private companies are more tightly constrained by limited resources and by Directors' and stockholders' objections to assumption of large but undefined and unlimited contingent liabilities. Moreover, the cost of insurance for certain activities may be prohibitive, or insurance may simply be unavailable. The near-universal recognition of these facts is what makes cross-waivers a standard feature of commercial space agreements.

While there is no doubt about the utility and practice of using cross-waivers of liability, the Department of Justice, in conjunction with NASA and the Department of State, recently

reviewed the legal authority employed for waiving claims of the United States and recommended that confirmation and clarification of that authority be obtained. Thus, in 1995, the President delegated to NASA authority to enter into cross-waivers of liability on behalf of the U.S. Government with our foreign partners in international agreements. However, to confirm and clarify the authority to waive such claims in instruments other than international agreements, such as agreements with domestic partners, legislation is required. That is what we are seeking today – an explicit statement of NASA's ability to waive claims of the U.S. Government in its domestic cross-waivers. Without this legislative change, the commercial aerospace industry supporting NASA's aerospace activities could be placed at a competitive disadvantage *vis-à-vis* our international partners, since NASA clearly can waive these claims in international agreements but may not be able to provide the same level of assurance in wholly domestic activities.

The second important and related provision which is notably absent from the House-passed bill addresses indemnification authority. Today, this Congress is faced with issues similar to those evaluated by an earlier Congress nearly twenty years ago. In 1979, the nation was planning its development of the first reusable launch vehicle, the U.S. Space Shuttle, which would be launched into space and return to earth, flying above major population centers on its journey. Because of this, many potential Shuttle users were reluctant to expose themselves to the chance of a Shuttle mishap over populated areas. Having several users on a single Shuttle mission also meant that the universe of potential claims was multiplied and the initial problem was exacerbated. Congress, however, saw the Space Shuttle as a powerful tool for national prestige, foreign policy, and economic growth if it could minimize the liability exposure to make commercial use of space viable. Congress also recognized NASA's ability to manage the Shuttle so as to minimize the risk assumed by the indemnification. As a result, Congress amended the Space Act to add a new section 308. Under this authority, Shuttle users are obliged to obtain third-party liability insurance (at no cost to NASA) to protect themselves and the U.S. Government from claims by third parties for damage or injury resulting from Shuttle activities benefiting the user. The amount of insurance has been fixed at no more than $500 million,

or the maximum amount available in the world insurance market at a reasonable premium. This formulation has a very real benefit to the Government as well. For third-party claims within the insurance amount, the treasury is protected by the insurance policies at no cost to the taxpayer. Only if payable third-party claims exceed insurance amounts does NASA accept payment responsibility.

The process by which NASA, in its discretion, provides indemnification is based on a case-by-case analysis of the inherent risks, available insurance, and the relationship of the activity to NASA's mission. NASA has generally required customers with primary payloads to buy the full amount of third-party liability insurance on the market. In addition, cross-waivers are always used where indemnification has been provided so that there is no risk of indemnifying against a claim that has been waived. Finally, NASA limits its risk through rigorous program management and oversight of the Shuttle vehicle operations program. As a result, over the entire period in which the authority contained in section 308 of the Space Act has been used, there has never been a third-party claim paid, additional resources have been available for space activity, and the cost of insurance has decreased.

By 1988, the commercialization of ELV's was a reality and similar liability concerns arose regarding ELV launches. Representatives of the aerospace and insurance industries, as well as outside organizations and individuals, testified before this Subcommittee that liability issues were an overriding concern. In response, building on the successful model of the Shuttle, Congress amended the CSLA granting the Department of Transportation (DOT) claims authority in support of commercial launch providers, crafting a process that virtually mirrors NASA's prior practice under section 308 of the Space Act.

Now, a new situation has arisen which calls for yet another approach to indemnification. In the past, experimental aerospace vehicles, or X-vehicles, were routinely produced under Government contracts and carried only Government property and personnel. As a result, the Government took full ownership of and liability for X-vehicles. If something failed

and damage resulted, it was clear who was responsible. A change in this situation led to the original language in section 308 of the Space Act, as the indemnification authority given to NASA in 1979 contemplated protection of private "users" of Government-owned space vehicles. Of course, back then there were no other kinds of space vehicles, and Congress originally did not intend to make NASA an insurer or indemnitor of private users of private space vehicles, not only because no one asked for such authority, but also because in such a case there would be no NASA R&D link to the flight. Instead, when such a situation arose, Congress passed the 1988 CSLA amendments, giving the authority to indemnify privately-owned space vehicles and activities to a regulatory agency.

Now, by attempting to lower the involvement of the Government and leverage the R&D investment of the taxpayer with corporate participation in the development of new commercial vehicles, NASA has created a new class of operation which falls between the old section 308 of the Space Act and the CSLA: a cooperative R&D effort that is not a traditional Governmental development program, has strong programmatic links to an R&D agency and industry, and ultimately has a commercial focus. As such, no current liability mitigation scheme fits, although NASA's funding and insight into the technology make NASA the agency most able to control the risk and the Space Act the proper location for the new authority.

The commercial focus of the Reusable Launch Vehicle (RLV) program makes a cooperative approach reasonable since the continuing Governmental interest in the nation's competitiveness justifies both the public investment in the program and some Governmental help in mitigating a potential liability which could undermine the entire effort. The most obvious example is the X-33 cooperative agreement, where a first-phase, R&D technology demonstration effort predominantly funded by the Government is anticipated to lead to a much larger, privately-funded full-scale development of a new vehicle. In this arrangement, ownership of the demonstrator vehicle remains in the contractor and responsibility for the joint tests of the X-33 demonstrator may be shared or stay with private industry. In such cases, potential liability to third parties becomes a

significant corporate issue and quite possibly a corporation's single overriding concern. If that concern cannot be mitigated, it will deter investment and research in new vehicles and lead to one of two bad results: no new vehicles will be developed, eroding the country's technological edge; or the Government will have to return to its old practice of fully funding new space vehicle development. It is my opinion that the concrete benefit of encouraging cooperative R&D outweighs the theoretical risk of third-party claims in excess of available insurance.

In short, existing indemnification authorities do not fit the legal arrangements that are currently being used as we move into an era of commercial space activity and "faster, better, cheaper" Government programs. The new approach for the RLV program, which may be extended to the next generation "future-X" and other follow-on efforts, is from a legal perspective, fundamentally different from the old "business as usual" approach. This does not mean there is not a large Governmental interest in the success of these programs. In fact, the Governmental interest may even be increased since we are attempting to achieve much more for the nation's economy with much less Government investment. But it does mean that some of the legal authorities that supported the old way of doing business may need to be modified to reflect the newer situation. Congress recognized this fact in 1979 when it enacted the original section 308 of the Space Act to meet the needs of private users of the Shuttle, and again in 1988 when it passed the amendments to the CSLA and gave DOT authority to consider claims arising from commercial space launches. It now needs to recognize it again.

On a final note, I want to also make it clear that the indemnification authority we seek is intended to be used only in NASA's domestic R&D programs. It is not to be available for use in cooperative international activities with foreign partners, such as the International Space Station. NASA and its international agreement partners regularly commit to an equitable sharing of any third-party liability arising from our cooperative space activities. That is an appropriate arrangement and is based on treaty. For non-governmental partners, however, no matter how small the risk of claims, the U.S. Government should

not indemnify activities of foreign industry. The requested legislation does not ask for or imply any such expansion of existing authority.

This concludes my prepared remarks, Mr. Chairman. The changes NASA requests have been through the Administration's coordination and clearance process and are consistent with the Administration's legislative program. I understand that some of the changes we seek in H.R. 1702 are already reflected in your draft bill, and we appreciate your continued support.

Thank you again, Mr. Chairman, Members of the Subcommittee. I would be happy to provide any additional information or answer any questions you might have for me.